Caste, Reservation Policy and Social Mobility in India: 1956 – 2017

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Abstract: The primary motivation of this paper is to estimate inter-generational social mobility rates of religion and caste-based social groups in India. With this aim, the paper introduces a data on approximately 150,000 individuals from an elite public university in Bengal (India). It finds that the society is generally rigid, with affirmative action playing a limited role in promoting social mobility. While establishing the causality of the said rigidity is difficult within the scope of the data, analytically the paper shows why endogamy is not the sole channel of social rigidity in India, and how caste based historical privileges can play a major role in determining the social rigidity. The results of this paper are found to be consistent for variations across gender and different streams of higher education.

Keywords: Caste, Reservation Policy, Social Mobility.

JEL Codes: N35, J62, J15

[1] This is the first draft of my JMP. Thus, this version is written with intentions of receiving honest and constructive feedback from researchers interested in similar fields. However, I request the reader to note the following:
A) Grammatical re-arrangements, shortening of sentences are yet to be done, please bear with the long sentences at times.
B) Appendix C is left blank intentionally and will be updated only upon getting the feedback of my advisors (whether they think it's important.
C) Since the topic of the research is politically sensitive in Indian context, I request readers not to quote the results or cite this unfinished draft unless a final version is made available, however, sharing with peers for feedback purposes are most welcome.
D) 'Acknowledgements' will be done in the later versions of the paper.

1 Introduction

"The value of a man was reduced to his immediate identity and nearest possibility. To a vote. To a number. To a thing. Never was a man treated as a mind. As a glorious thing made up of star dust. In every field, in studies, in streets, in politics, and in dying and living…My birth is my fatal accident."

~ From the suicide letter of Rohith Vemula, A *Dalit* Scholar (1989 – 2016)

In a huge country like India where about a third of its population staggers around the poverty line, only a few even dream of getting a PhD. Rohith Vemula not just dreamt but earned himself the position of a doctoral student in an elite public university in India. Eventually, Rohith had to commit suicide, and he blamed that his birth as a 'Dalit' (lower caste, according to Hindu religious doctrines) itself was a 'fatal accident'. He alleges, that caste-based discriminations in the Indian society reduced him to his 'immediate identity' of being a 'Dalit' - the hardest obstacle for him to overcome.

One might take a pause here, and wonder for a moment - what could possibly cause a person's caste position to become the 'hardest obstacle', given that the student had to actually pass a number of increasingly difficult qualifying exams to become a PhD student in first place? This paper, thus, originates from the motivation of finding the answer to this rhetorical question, by developing and addressing several technical questions that could possibly appeal to economic historians as well as sociologists.

The 'caste' system, (estimated to be 3000 years old) divides the Hindu population into five mutually exclusive, endogamous, hereditary and occupation specific groups. India, in its present demographic structure is a predominantly Hindu nation and thus, the socio-economic outcomes of a Hindu individual is often dependent on the individual's caste position. Historically, the top three groups in the hierarchical order of caste (namely the *Brahmins*, *Kshatriyas* and *Vaisyas*)

experienced better socio-economic outcomes relative to the lowest caste groups[2] (namely *Sudras* and *Ati-Sudras*). Even if the class or occupation of a family changes, their caste identity can never be changed. In practice the caste system often leads to prohibition of inter-caste marriages, segregated residential areas and schooling etc. Thus, on one hand the upper castes continue to bear the fruits of their historical privilege accumulated over generations, and on the other, the lower castes continue to be systematically discriminated despite constitutional protections provided since India's independence.

Since the caste system is based on several complex socio-economic terms and conditions (and not singularly on occupation or income), this systematic divide provides an unique ground for analyzing intergenerational social mobility based on caste groups, as compared to the traditional approach of analyzing social mobility based on linking generations of families. In fact, census data on individual or household level characteristics such as income, educational attainment or occupation is not publicly available, which makes it impossible to link families across multiple generations at all. Further, as pointed out in Clark et al. (2012, [1]) – "… the large number of people still engaged in agriculture make occupational status classifications difficult. Studies of mobility based on occupational classification are thus difficult to interpret, and to compare with those from more developed economies".

This, is exactly where caste comes in. While it is true that acquiring individual level data on one's caste membership is legally restricted in India, indirect information on caste membership (to a large extent) can be traced from an individual's surname. Thus, for purposes of analysis, each caste group could be viewed essentially as a collection of unique surnames. Therefore, if one extends the idea of intergenerational mobility from 'mobility of unique families across generations' to 'mobility of unique *groups* of families across generations', caste membership can work as a linkage across generations for estimating intergenerational social mobility.

[2] Even if one ignores the non-academic reports of alarmingly high rate for violation of human rights of these communities, there are multiple evidences in economic and sociologic literature that reflects continued discrimination against the lower caste population. To name a few, Desai, Adams, and Dubey (2006), who documents many instances from their fieldwork in which social distance and exclusion translate into active discrimination in access to government services and employment. In fact, there are various standard of living indicators that establish persistent inter group disparity between SC/STs on the one hand and the rest. In the absence of reliable income figures at the national level, monthly per capita expenditure (MPCE) is routinely used as a proxy for standard of living. Using National Sample Survey (NSS) data, Deshpande (2005) provides a detailed account of levels and patterns of consumption expenditure for SC/ST and Others and changes therein over the last two decades at the national and state levels.

Reservation Policy (henceforth, RP) is another key motivation behind analyzing social mobility based on caste. RP is the world's oldest affirmative action program, constitutionalized in 1950 in India, with the aim of promoting social justice, equity and mobility. The primary target was to bring the lower caste groups into the mainstream of development and to compensate against centuries of discrimination. In terms of implementation, this policy reserves a percentage of seats in the government and semi-government jobs and educational institutions. The key thing to note here is that RP was solely based on caste, and remains largely so till date, despite several significant modifications during the 1980s. Therefore, with a policy like RP in place, the analysis of caste-based social mobility becomes even more interesting, especially since promoting social mobility was one of the declared goals behind introducing RP.

The first objective of the present paper is thus, to estimate the 'implied' rates of social mobility for various caste groups and see, to what extent mobility of these groups are related (if at all) to RP. This will contribute towards filling up the void in literature related to economic history that studies mobility rates in India, in addition to the recently growing economic literature involving caste groups in India. Further, the paper can hopefully add some fuel to the debate whether RP (or Affirmative Action policies in general) is at all effective in promoting social mobility.

Clark et al. (2012) outlined how to achieve this objective for groups of surnames, by using rates of relative representation[3] as the base for building an index of social rigidity, which in turn can imply the rates of social mobility. This paper applies a similar estimation strategy on a previously unused, yet publicly available register on graduates from an elite public university[4] in India. For each cohort graduated since the university's foundation in 1956 till date, the register reveals a student's full name, field of study, degree type (bachelors, masters, PhD etc.) as well as their rank in the graduating cohort (applicable for masters and bachelor's degrees). Once the surnames are classified into several social groups, I estimate the implied rates of social mobility. The results generally agree with the findings by Clark et al., in the sense that Indian society is (in general) a highly rigid one. However, this paper presents further evidences that shows possible correlation between changing patterns of relative representation for different social groups, with modifications

[3] For now, 'rate of relative representation' could be interpreted as a weighted measure of representation for social groups. The mathematical definition will be provided in section 4.

[4] According to QS world university rankings of 2018, 'Jadavpur University' is ranked among 601 – 650 in world, 125th in Asia, and 74 among the BRICKS nations. Within India, it is ranked 6th among all universities in India by National Institutional Ranking Framework by the Ministry of Human Resource Development, Government of India.

in RP during the decades of 1980-1990. Therefore, this paper finds it hard to believe that RP did nothing to improve social mobility, albeit the implied intergenerational mobility rates are indeed very low (considering that RP was in play since 1950).

These observations raise two further questions of interest, both of which could be addressed within the scope of the paper, with the same data and empirical approach (except for certain modifications as explained in section 4),

First, what is the cause of this rigidity? Is it simply endogamy imposed by restrictions on inter-caste marriages, as conventional wisdom would suggest? Or, are there other factors such as historical privilege that could also be playing some role? To address this question, I use sub-caste[5] based analysis of social mobility. The key reason behind such an analysis is to check if endogamy is the sole factor behind the observed social rigidity. I argue, if that was indeed the case, then we would necessarily observe higher rates of implied mobility between surnames belonging to the same caste – since intra-caste marriages between sub-castes have largely been accepted in India for a long time. The results indicate that hierarchy within a caste imposes almost equivalent social rigidity as the hierarchy between the caste. Therefore, this paper argues that endogamy is not the unique channel causing lower rates of implied mobility.

The second question is based on the evidence which suggest that the lower caste students have been experiencing faster growth (in rates of relative representation) since the 1990s. The question is, at what expense? Chances are that upper caste students will perform better with RP in place, since the implementation of RP might cause relatively 'less meritorious' students to displace relatively 'better' upper caste students. This is an important issue to address, especially since it is often argued that affirmative actions could compromise with merit (or efficiency) in order to achieve the stated goals of equity.

This question is addressed by utilizing the information on the merit-based ranking of each graduate in their respective graduating cohorts. The idea is to see how rates relative representation of social groups have changed within the truncated data of top 15 percentile of individuals in each decade, followed by estimation of social mobility as well. While the relative rates of representation among the top 15 percentile shows the extent to which different social groups have performed over time,

[5] Determined by the hierarchies in social prestige within a caste group. More discussions on caste and sub-caste follows in relevant sections of this paper.

it can also detect any movement (upward or downward) for these groups. The results suggest against the conventional wisdom and finds that the representation of lower caste groups within the top 15 percentile increase sharply since the ’90s, displacing both Brahmins and Non-Brahmin upper castes. Since the grading of university exams do not vary across social groups, this finding implies that the displacement of upper castes are not compromising the overall academic quality or merit, in fact, meritorious and competitive lower caste students have been integrating faster to the stream of this elite university since the modification of RP in the 1990s. Even the implied mobility rates for this top 15 percentile, or, the so called ‘elite of the elites’, is relatively higher for all groups, as within this percentile, convergence is faster between the under and over-represented social groups.

To summarize, the three central findings of this paper are, first, that the Indian society is an extremely rigid one in terms of caste-based social mobility, although the target group of affirmative action does experience a little better rate of social mobility. Second, that this rigidity is not entirely attributable to endogamy since even without endogamy there exists substantial rigidity within each caste group. And third, that the RP is possibly paving a way for the meritorious students from lower caste to integrate with elite streams of higher education.

To check if these central implications hold good across all other parameters in the data, I incorporate gender (identifiable from first names, albeit in a strictly hetero-normative sense) and faculty of graduation (Arts, Science or Engineering) as factors that could possibly affect these mobility rates. I find that it mostly does not change the patterns or overall implications, except for, in the faculty of Arts, the highest caste groups dominate the top 15 percentile of ranks and experiences improvement in their rank during the post 1990s. This is in contrast to the general findings of this paper, however, section 6 discusses all these results in depth, and argues why among other factors, liberalization of the Indian economy could have played a role behind such observations.

Overall, this paper could thus contribute (potentially) to not just economic history, but to several literature related to education, public and labor economics.

Last, but never the least, to utilize the scope of the data to the best extent, I identified Muslim surnames, and incorporated them in all above analysis. Thus, most of the tables and graphs do reflect the situation of social status for Muslim individuals. However, Islam being the second

largest religion in India by population share, the case of the Muslims and the interesting findings related to their mobility experience deserves the attention of another academic paper. In the scope of this paper, the results for the Muslim community provide a benchmark for discussing and interpreting the situation of the Hindu caste groups. This aspect, however, is important and not just because of the higher share of population. On one hand, the Muslims experienced representation rates like that of the lower caste groups, while on the other hand, most of the Muslim community did not enjoy the benefits of RP. Thus, the case of the Muslim community provides a near-perfect counterfactual for showing what could have been the possible path of representation and social mobility for the lower caste groups, if there was no RP in place.

The rest of the paper is arranged as follows: section 2 discusses very briefly the historical background of caste system and the reservation policy, both with respect to India and the state of West Bengal (since the university is located in that state). Section 3 reviews relevant literature to guide expectations about the research, as well as it discusses the edges of the present work over the prior ones. Detailed description of all sources of data used in this paper along with the methodology are presented in section 4. Section 5 elaborates the results while section 6 checks the consistency of the results with respect to gender and faculty of graduation, respectively. Both these sections are further divided in subsections to discuss each result and associated factors separately. Section 7 notes the limitations of the present work and concludes.

2 Caste Structure and Reservation Policy: Looking back in History

2.1 Caste and Sub-caste

According to the Hindu religion, the 'varna' system divided the Hindu population initially into four and later into five mutually exclusive, endogamous, hereditary and occupation specific groups (in order): the Brahmins (priests), Kshatriyas (kings and commanders), Vaisyas (businessmen, farmers etc.), Sudras and Ati- Sudras. The Sudras and Ati Sudras comprised of people doing menial jobs with the latter being considered "untouchables" or Dalits, in that even their presence was considered polluting and thus was to be avoided. The low status of Dalits is supposedly due to their engagement in occupations that are considered polluting or profane, such as skinning animal carcasses, butchery of animals, removal of human waste, attendance at cremation grounds, washing clothes, and fishing. Upper caste Hindus avoid physical contact with people engaged in these polluting tasks. This includes the prohibition of interactions involving any kind of direct physical contact, such as sharing utensils and water wells, as well as exclusion from social activities. The three higher varnas are often referred to as "caste Hindus" (upper caste Hindus) and constitute 17-18 percent of the population, while the Ati-Sudras are roughly 16 percent of the population. Numerically, the largest varna is Sudra, constituting nearly half of the population.

Estimated to be over 3000 years old, the caste system has of course undergone many transformations. The divisions explained earlier are rather the manifestation of the ancient varna system that corresponds to a rudimentary economy. Over the years as economy and society grew more complex, this system metamorphosed into the '*Jati* system', with features similar to the varna system, but with some differences. Firstly, the number of jatis today is estimated to be between 2 to 3000. It is a testimony to the complexity of the system that even the exact number of caste divisions cannot be determined with certainty. Secondly, most jatis are regional categories, making inter-regional comparisons of jatis less than straightforward. It must be noted that jatis are not clear subsets of the varnas, thus making the ranking of jatis an enormously complicated task, if not an impossible one. Thirdly, the jati-occupation link is not as straightforward as the varna-occupation link. However, the association between jati and varna at the topmost level (Brahmin jatis, most Kshatriya jatis) and at the bottom (Ati-Sudra or former untouchables) is clearer than it is in the middle ranks.

These two systems together form thousands of sub-castes in the present Indian society, and often makes it too complex to assign a hierarchical order between the sub-castes.

2.2 Constitutional Identifications: SC, OBC and ST

Being at the bottom of the caste hierarchy, the former untouchables not only are poorer, they continue to be targets of discrimination, oppression, violence and exclusion. The names of these jatis are listed in a government schedule and thus in official literature these castes are referred to as Scheduled Castes, or simply as SCs. The initial constitutional classification of caste groups was done by the British rulers and it is often argued that the primary classification suffered from severe misidentification. However, these lists were later updated by the Indian government to rectify some of the errors. According to the most recent records, the state of West Bengal lists a group of 60 communities as SCs (See appendix B), who constitute an estimated 23.5 percent of the total state-population. The surnames of people from these communities are usually distinguishable, hence, despite the complexities mentioned in section 4 of this paper, caste classification based on surnames are possible for a large number of surnames.

Very close to the social and economic position of the Dalits are the erstwhile Sudra jatis that, however, have not been targets of untouchability. The blanket term “Other Backward Classes” (OBCs) is supposed to capture the groups that have been described in the constitution as “socially and educationally backward classes”. Further, a part of the Muslim community in India is also listed as OBC. However due to the mixed nature of this group in terms of socio-economic conditions, the caste of the OBCs cannot be identified perfectly from their surnames. Thus, although 62 communities are listed in West Bengal as OBC.

In addition to the caste system, more than 50 million Indians belong to tribal communities that are often distinct from the Hindu religious fold. These are the Adivasis, (literally, original inhabitants) who have origins that precede the Aryans and even the Dravidians of the South. Many have lifestyles and religious practices that are distinct from any of the known religions in India and languages distinct from the official languages of India and their dialects. Most live on the margins of existence, excluded from the mainstream development process. These tribes are also a key target of affirmative action, listed by the government in a schedule and hence referred to as Scheduled Tribes or STs. The STs constitute about 6% of the state-population of West Bengal. Like in the case of SCs, their surnames reveal their identity as ST almost in all cases. However, since the SCs

and the STs are both equally underprivileged (with natural exceptions of sub-caste hierarchies), this paper identifies the groups together as one single group, namely “SC/ST”.

Since the decade of 1950s, individuals belonging to SC/ST community can apply for receiving a legal document titled ‘caste certificate’ from local administrative officers. A copy of this certificate is usually furnished to the relevant authorities before an individual can enjoy the benefits of RP.

2.3 A Brief History of Reservation Policy

First and foremost, it should be noted that in independent India, untouchability is abolished by law, and caste-based discrimination is a crime, in principle. Also, in keeping with the ideal of a casteless society, an individual is not obliged to disclose his/her caste (jati) anywhere. Data are, therefore, not available by caste: the last jati based census was in 1931. Since caste is not ascriptive in the same way as race in the United States, it is not always possible to ascertain the caste status of an individual if he/she chooses not to reveal it, especially in urban areas. However, overt and covert instances of untouchability continue, and caste is used as a basis of both social and economic discrimination. Right since the time of its inception in 1950, the Indian constitution accepted this socio-economic reality of caste-based discrimination and launched the affirmative action policy, which is now the oldest such policy in the world. In 1954, the Ministry of Education suggested that 20% of places should be reserved for the SCs and STs in educational institutions with a provision to relax minimum qualifying marks for admission by 5% wherever required. However, in practice this was not implemented uniformly across the states and institutions for several reasons including the reluctance of the local administration.

A significant social and institutional change began in 1978 when the ‘Mandal Commission’ was established to assess the situation of the socially and educationally backward classes. In 1982, it was specified that 15% and 7.5% of vacancies in public sector and government-aided educational institutes should be reserved for the SC and ST candidates, respectively. The commission did not have exact population figures for the OBCs and so used data from the 1931 census, thus estimating the group's population at 52%. In 1980 the commission's report recommended that a reserved quota for OBCs of 27% should apply in respect of services and public-sector bodies operated by the Union Government. It called for a similar change to admissions to institutes of higher education, except where states already had more generous requirements. It was not until the 1990s that the recommendations were implemented in Union Government jobs. However, in the field of higher

education, the modified version of RP was implemented in all the states during the 1980s. Thus, almost for all the states, this decade marks the beginning of the modern era in implementation of RP. In fact, as RP became applicable for OBCs, a part of the Muslim population listed as OBC, could now benefit from the provisions of RP for the first time. For simplicity, this paper at times will refer to this version of RP as modified RP.

As expected in a semi-federal structure like that of India, each state has its own version of RP. In West Bengal, from the decade of 1980s, in any public educational institution, 22% of all the seats were reserved for the SCs, whereas 6% were reserved for the STs and 7% for the OBCs. After reviewing the poor socio-economic condition of the Muslims, the OBC reservation in West Bengal was increased by 10% in 2012 to bring a higher share of Muslims under RP, thus, presently a total of 45% of all the seats in a public educational institution in West Bengal are reserved under RP.

3 Expected Effects of Caste System, RP and Prior Literature

Analyzing caste-based discrimination in India almost always rings a bell in a researcher's mind – the case of racial discrimination in the US, in fact, the methods and modes of analysis of racial and caste-based discrimination might often intersect. Thomas Weisskopf (2004, [2]) identifies the various conditions that are most likely to influence the consequences of positive discrimination (PD) in these two countries[6]. It is thus wise to mention a few relevant literatures from the case of race in the US. Bowen and Bok (2000, [3]) find that at each 50-point SAT interval the probability of college admission in elite schools is considerably higher for black students than for comparable white students, so that a race-neutral admission policy would substantially reduce the overall probability of admission for black college applicants to top schools. Long (2004, [4]) estimates that accepted minority students in "elite colleges" (colleges in the top decile) would be reduced by 27 percent if preferential admissions for minority students in the United States were eliminated. Epple et al. (2008, [5]) likewise find that race-neutral policy would markedly reduce attendance of minority students in upper-tier colleges, and Howell (2010, [6]) finds advantages in admission for black and Hispanic applicants among the "most selective colleges." Thus, one would expect similar trends (although different in magnitudes) in the estimated participation rates of the SC/STs

[6] According to Thomas, Degree of homogeneity, degree of recognizability, extent of socio-economic disadvantage, extent of stigmatization, extent of segregation makes the cases different in the US and India; he further argues that intergenerational history of discrimination suggests more severe discriminations in the Indian society than in the US.

(and Muslims) in India during the post RP decades. However, as expected from a country full of contradictions such as India, many factors intertwine to make this analysis further difficult. The literature on caste-based discrimination often contradict each other than validating themselves, on account of factors such as complexity of demographic structures, lack of data, administrative corruptions etc. leading to various unpredictable biases.

Corruption:

(i) Although most of the literature finds that the participation of SC/STs have increased with RP, Velaskar (1986:600-01, [7]) and Patwardhan et al. (1992:24, [8]) demonstrates cases where some non-SC/ST applicants manage to claim SC and ST status with the help of corrupted local administration and thereby gain admission via reserved seats to institutions for which they do not qualify as general entrants; thus the data on student enrolment presented in the annual reports of the Ministry of Human Resources Development, Government of India, overstates the SC/ST enrolment by a significant margin.

(ii) It is not guaranteed that the decades following the modified RP, will necessarily experience a rise in the educational participation of SC/STs. On one hand these communities faced continued discrimination, on the other, the public universities have often failed to implement RP properly, Thus, even when data on enrolment (or graduation) is available, no effect of RP may be captured. Xaxa (2002, [9]) attempts an assessment of reservations in the University of Delhi, one of the most elite institutions in the country. In 1999-2000, of all the undergraduate students, only 8.6 percent were SC (with a quota of 15 percent) and 1.8 ST (quota of 7 percent). Of the post- graduate students, 5.5 percent were SC and 2 percent ST (with actual quotas the same as that at the under-graduate level). Thus, quotas are grossly under fulfilled and if this could happen in the most elite university in the capital city, one can understand how worse things might be in other parts of the country. The situation in the teaching posts is even worse. Teachers in Delhi University have bitterly opposed the introduction of affirmative action, even though it is a constitutional provision. As a result, reservations were introduced as late as 1996. At that time, out of the 700 teachers in postgraduate departments, 7 were SCs and 2 STs. Out of the 4512 teachers in university affiliated undergraduate colleges, 11 were SCs and none were ST. Thus, the implementation of the reservation policy is itself a big challenge in India, which again might be attributed to the corruption in administration, and possibly due to the caste prejudices embedded in the society. An

important point to note here is that ‘administrators’ are often members of privileged higher caste who have historically opposed RP in India.

Complex Demographic Structure:

The caste-based discrimination is more direct and often lead to physical violence in the rural areas, where people live in segregated villages. Clark points out that the primary beneficiaries of reservation policy are people from the urban middle class who are relatively more privileged than the most intended beneficiaries of RP. Sacchidananda's (1977, [10]) work on the 'Harijan Elite' (or the ‘untouchable elites’) claims that reservation policies have created a privileged SC community devoted to its own advancement and uncaring about the wider situation of the community. The extension of this argument is that the economically poor upper caste students are displaced by lower caste population. This view would again be contradicted by evidences from Frisancho Robles and Krishna (2012, [11]) who suggest that the affirmative action seems to be effectively targeting SC/ST students who are poorer than the average displaced higher caste student, hence the complexity of the demographics in India makes it difficult to interpret the results. This in fact is the reason why there is little to no discussion in economic literature on sub-castes as the internal hierarchies within a caste is way too complex.

Paucity of Data

What makes it most difficult to claim any finding to be substantial, is the lack of data. Although there exist important findings such as the one by Bertrand et al. (2010, [12]) that estimate positive labor market returns to attending an engineering college among both lower-caste groups (SC/STs) and upper-caste groups. However, due to small sample sizes, the estimates remain highly unreliable. Exactly for this reason, most of the existing literature deals with data collected prior to the modern RP implementation era. Thus, many promising researches such as Vakil (1985, [13]); Aikara (1980, [14]); Chitnis (1986, [15]) could easily be termed as ‘ancient’ if one is looking for the most recent pictures, or for capturing the inter-generational changes.

The most recent research that tried to capture the interplay of caste and RP is by Bagde et al. (2016, [16]). They show the SC/STs have indeed made some remarkable progress, and that progress is highly associated with RP. Much like the present work, they also examined the college matriculation and academic success of students in more than 200 private non-profit engineering

colleges in a large State (with a population of more than 80 million) in India. To the best of the present author's knowledge, this is by far the biggest data ever analyzed in such fields of literature.

However, this suffers from various drawbacks. First, although in the semi-private colleges[7] RP is implementable by law, some of these colleges offer a different minority quota such as 'Linguistic Minority Quota'. In such colleges, caste-based RP do not apply. Second, the private colleges or universities are not bound to follow reservation policy. Thus, whether all the engineering colleges considered for analysis were uniformly following the state's RP cannot be confirmed.

Second, the question of aspiration as well as competition are of prime importance in any work of research that deals with caste. Due to historical discrimination, on one hand the members of lower caste do not even aspire to study in the elite institution of education such as engineering and medical colleges; on the other, the centralized admission tests to such engineering colleges are often offered only in English. Kumar (1997, [17]) presents a very useful analysis of the role of the English language in Indian educational inequality, which implies a non-selection bias may often be induced while looking at the data from elite engineering colleges. Thus, the only people who survives the admission entrance are those with substantial proficiency in English, which is much less common for a SC/ST student (via the channel of poor primary education, low-quality schools in immediate neighborhood etc.).

Third, there is a huge intersection between the poor (the lowest class) and the SC/STs (the lowest caste). The public universities in India continue to offer qualitatively superior educational training at a significantly lower cost, whereas the private universities not only lack that quality but also charges about 0.4 to 0.7 million INR on average, which is not affordable by a huge percentage of the lower caste. Thus, it is highly likely that a big part of the SC/STs in these private engineering colleges belonged to wealthy elite families who had better opportunities than the rest in terms of parents' income, parents' education as well as experienced higher quality of schooling through-out their lives.

Based on the discussed complexities, one can assume that there is no guarantee that an effect of RP on rates of relative representation would necessarily show up. And even if it does, it may not match with any previous works. However, the theoretical possibility is that the participation and

[7] These are partially funded by govt. and/or affiliated to a public university.

relative representation of lower caste groups and Muslims should increase while Brahmins would experience a lower share with modifications in RP.

The present paper, however, could possibly have certain edges over the prior literature. First, it is worth to note that the proportion of people below the poverty line among SC/STs is about 50% higher than that among the general category (Chakravarty and Somanathan, 2008, [18]). The data analyzed in this paper comes from a public university which offers most of its programs for a fee of 200 INR (approximately 3 USD) per month, which makes the university affordable to almost everyone. Further since it is a government funded institution, unlike the private universities, it is bound by law to follow and implement RP.

Second, the entrance test for the engineering is held in local language as well, making it more accessible for all.

Third, not only it offers courses in Engineering, but also in general topics across disciplines of science, arts, and occupational trainings such as Bachelor of Education, various diploma degrees etc. – thus a varied set of career choices would be observed in the data. In fact, this data will throw some light to see what courses are popular among the SC/STs or the upper castes (if any at all) and to analyze the associated channels.

Fourth, the state of West Bengal has seen relatively lower rates of continued physical violence against the SC/STs, which is more common in certain other states in India. That makes it somewhat possible for the lower caste in West Bengal to at least aspire for becoming a college graduate, since survival itself is an uncertainty for a majority of Indian SC/ST population living in other states.

Fifth, despite being a unique state within India, West Bengal has certain population characteristics (such as the proportion of each caste and religious groups in its population) that are extremely similar to the overall national characteristics. This is important, since the present analysis uses an index that relies on the population share of each group, and therefore, estimates based on West Bengal could be reflective of overall Indian society. While it can still be biased, at least the direction of the bias could be guessed.

Finally, the data is dynamic in time, unlike most of the cases, and it covers six decades of graduation records. The only comparable timeline is that of Clark et al. (2012), which is larger in time horizon but much smaller for a given time. The paper deals with mobility within elite

occupations such as doctors and civil servants, rather than looking at the education, but despite the differences in the data, the similarity in empirical strategy will allow meaningful comparisons.

4 Data, Classification and Methods

4.1 Data and Classification

Source URL: http://www.juresultdirectory.org/

The main source of data for this paper comprises of graduates from Jadavpur University. As discussed earlier in footnote 3 of section 1 as well as towards the end of section 3, this university is an elite public institution, bound by law to follow and implement RP. The data provides a list of individuals in order of merit[8], from 1957 to 2017 across the following:

Degree Objectives: (i) Undergraduate (3-year program known as bachelor's degree in all faculties), (ii) Postgraduate (2-year program known as master's degree in all faculties), (iii) Doctor of philosophy (in arts, science, engineering and pharmacy), (iv) Master of Philosophy (commonly known as M.Phil., awarded in all faculties);

Faculty: (i) Arts (across 18 various departments), (ii) Science (across 16 different departments), (iii) Engineering (in 25 different streams of specialties), (iv) Inter-disciplinary studies in law and management (in 12 departments);

The data on graduation records are then used to identify gender of each individual student, in a heteronormative way though. Due to the gendered way of naming children, from the first names of each individual one can *almost*[9] surely identify the gender of that individual. In fact, for the earlier decades, some of the female names reveal the marital status as well.

Gender identification from first names is laborious yet easy, but since surnames were often replaced with 'titles' conferred by the British administrators, and due to centuries of evolution of surnames, it is extremely difficult to assign an individual's caste with certainty. One example could be the surname 'Halder' itself, which may belong to the group of SC as well as the Brahmins or,

[8] Being a British colony, India adapted a system of classifying students in First Class (score of 60% or above), Second Class (score of 45% to 60%), and Pass Division (Pass percentage to 45%). This information is also available, and could be used for certain analyses, however, since the absolute rank of each of the individuals are already listed (even the ties are archived properly), the information on division/class becomes redundant.

[9] Except for the cases where differences in the pronunciation of a name is lost in the way it is spelt in English. Such cases are rare though.

could be neither SC nor Brahmin. However, a book written in Bengali, titled 'History of our Surnames' has helped me to a great extent for assigning caste identities of the individuals. The individuals are thus broadly classified into four groups – (i) The Brahmins (the highest caste), The SC/STs (the lowest caste), (iii) The Muslims, and (iv) NBU which stands for non-Brahmin upper castes.

The individuals classified as 'Brahmin' and 'SC/ST's are almost perfectly classified, in the sense that they exclude any surname that has even the slightest chance of being held by a member of another caste. This strict exclusion of non-Brahmin and non-SC/ST surnames from the 'Brahmin' and SC/ST groups, ensures a trustable comparison of mobility over decades across these caste groups. The Muslims, as specified earlier, are identified perfectly from their first and last names which are completely distinguishable from any other religion. The group 'NBU', however, may contain some individuals with surnames that at times could be held by Brahmins, but never by the SCs.

To fine tune the classification, I created a fifth category called NBU/SC which includes surnames like 'Halder's, that could belong to either NBU or SC. The goal is to estimate what proportion of these surname holders are actually a member of lower caste (SC). For this purpose, I use the admissions register of the same university, which is available for certain departments for certain years within 2011 to 2018[10]. The admissions records list all individuals who applied (irrespective of whether they were admitted) and reveal an individual's caste if the student applied under SC, ST or OBC category. I accumulate all the names from these registers and extract those surnames I identified as 'NBU/SC'. Among these, I calculate the share of the so called mixed surnames (such as the Halder's) which are classified as SC. Assuming that this share remained more or less the same through decades, I assign similar percentage of 'NBU/SC' students as SCs in each decade and the rest as NBUs. For example, if out of 20 individuals with the surname Halder that appear in admissions records, 5 are revealed to be SCs, I classify 25 percent of the Halder's in each decade as SC, while the rest are enumerated within NBU category. The assumption that these internal proportions are constant, could be questioned, sure, but the absence of this assumption will lead to severe unreliability of results as well as a loss of data.

[10] The missing departments or years are irrelevant here since it is not being used for analyzing mobility directly.

Identifying sub-castes based on surnames are further tricky but consulting several experts on the matter of caste helped me in classifying the Brahmins, NBUs and the SC/STs into further sub-caste groups in order of internal hierarchies of surnames belonging to the same caste. These groups are described in the relevant subsections of section 6.

For estimating population shares of each social group, I used aggregates from decennial Censuses conducted in India till date. The estimated shares of Brahmins in the population for all these decades are obtained from Prof. Gregory Clark, who used these estimates for his research in 2012. To estimate population shares of sub-castes is less straight forward, due to the lack of census data that can reveal the percentage of the sub-caste groups in population. Therefore, I used electoral registers of Bengal to estimate the proportion of each surname (or a collection of surnames). These electoral registers are publicly available records that list the name, age and address of voters within an administrative zone. Since caste system imposes segregated systems of living, obtaining a proper estimate is also difficult. Therefore, I used a variation of clustered sampling strategy as outlined in appendix C to select 50 electoral registers from across the state of Bengal.

4.2 Method

First, rate of relative representation of a social group z within in an elite group during the time point (or period) 't' is defined as,

$$R_t^z = \frac{Share\ of\ Group\ z\ in\ the\ elite\ population}{Share\ of\ Group\ z\ in\ the\ general\ population}$$

If a society is mobile, then the groups with relative representation differing from 1 should tend towards 1 over time, and the *rate* at which it tends to 1 is determined by the rate of social mobility.

The measure of social mobility used herein is the b in the equation

$$y_{t+1} = b*y_t + e_t$$

where y could in general be a measure of socio-economic status, which follows a normal distribution, with mean 0 and variance σ^2.

Suppose that a group, z, has a relative representation greater than 1 among elite groups. The situation looks like figure 1, which shows the general distribution of status (assumed to be

normally distributed) as well as the distribution for a privileged group. The green line stands for elite cut-off of the population, for example, if only 1 percent of the population are graduates from an elite university, the area to the right of the green line will be 0.01.

The overrepresentation of a group in this elite section of society could be produced by a range of values for the mean status, $\bar{y}_{z0}$, and the variance of status, σ^2_{z0} for this surname. But for any assumption about ($\bar{y}_{z0}$, σ^2_{z0}) there will be an implied path of relative representation of the group over generations for each possible b. This is because

$$\bar{y}_{zt} = \bar{y}_{z0} * b^t$$

Note further, since $var(y_{zt}) = b^2\, var\,(y_{zt-1}) + (1 - b^2) * \sigma^2$, solving this recursively yields,

$var(y_{zt}) = b^{2t}\,\sigma^2_{z0} + (1 - b^{2t}) * \sigma^2$

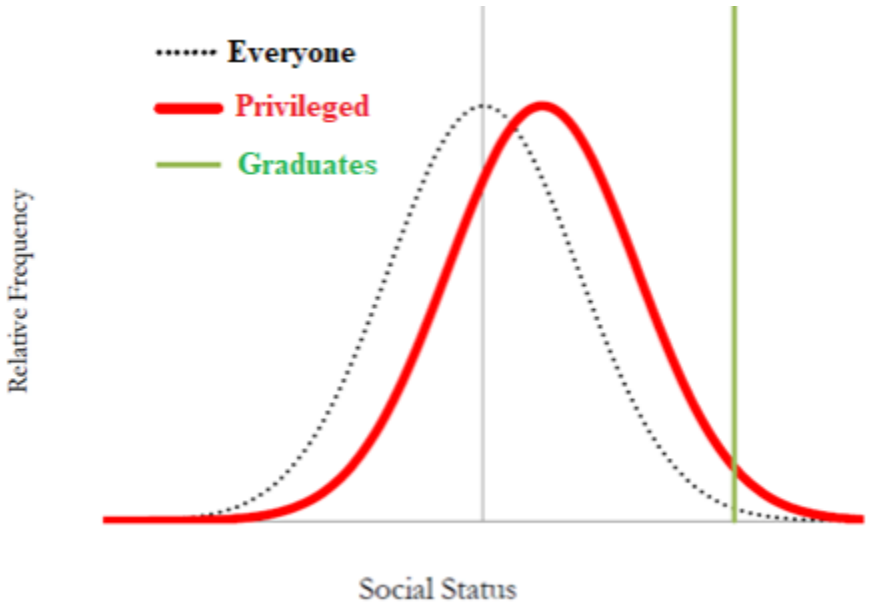


Figure 1 [Reproduced from Fig. 3, Clark et al. (2012)]

With each generation, depending on b, the mean status of the elite group should regress towards the population mean, and its variance increase to the population variance (assuming $\sigma^2_{z0} < \sigma^2$). Thus, even though one cannot initially fix $\bar{y}_{z0}$ and σ^2_{z0} for such groups in the first period, one can fix these by choosing them along with b to best fit the relative representation of the elite surname

z in the social elite in each subsequent generation. As Clark et al. (2012) already points out, in the case of India one can safely assume that the variance of status among the elite is by the modern period as great as that for the general population.

In practice, the implied rate of persistence 'p' of any group, during the period 't' and 't+k' would be calculated in two steps:

Step 1: Calculating the 'elite mean'

$$D_t^z = Zscore(E_t) - Zscore(R_t^z * E_t)$$

E_t , as described already, stands for elite cut-off of the population (the green line figure 1) and R_t^z is the relative representation of group z, as defined in the beginning of this section. Thus, D_t^z is essentially a measure of deviation (or simply distance) from the elite population for group z at time t.

For this paper, the cut off is estimated at 0.002 for postgraduates and 0.012 for undergraduates, since 0.02% and 0.12% of total population are enrolled in postgraduate and graduate degree programs in West Bengal[11]. This cut-off should theoretically vary with time, however, since the results are not sensitive to this cut-off if these elites constitute less than 5% of the total population. And if in 2017 the proportion of graduates are already so less, it only implies that for all previous decades, this percentage could not be higher than 5%. Therefore, for all practical purposes of this paper, this elite cut-off is assumed to be time invariant.

Step 2: Calculating the implied rate of persistence 'p':

For a given group z, the implied rate of persistence between periods 't' and 't+k' would be calculated as,

$$\text{p} = \left(\frac{D_{t+k}^z}{D_t^z}\right)^{\frac{1}{k}}$$

[11] Source: Ministry of Human Resource and Development, Govt. of India (A 2017 report)

To have an idea of the interpretations, by construction, a value of p close to 0 will imply very high rates of convergence to the line of proportionate representation or $R_t^z = 1$, whereas, a value around 1 will imply very slow rate of convergence.

5 Main Results

Note*: Since the trends for undergrads and postgrads are almost same in terms of relative representation, unless there is a stark difference between these two types of elites, the graphs are provided for undergraduates only. The tables, however, incorporate all the results for postgraduates as well.*

Result 1: *Social Mobility and RP: Caste imposes rigidity, but RP helped SC/STs to become relatively more mobile.*

Rates of relative representation for four social groups of interest are plotted in graph 1. This graph confirms that despite RP being in place, until the decade of 1980-90, the lower caste groups experienced almost similar representation as the Muslims – a community without the benefits of RP. Further, the Brahmins and Non-Brahmin upper castes continue to be over-represented in the population of elite undergraduates, albeit these rates are decreasing since the '90s.

Although the rate of relative representation is at best a summary statistic, the graphs still reflect an extremely interesting feature involving RP. To quickly recall, the report of Mandal Commission (submitted in the 1980s) were implemented across the nation during the 1980s and '90s. This report advocated in favor of a 27 percent reservation for the OBCs in all government educational institutions and included some Muslim communities under the RP. The Mandal Commission report was not directly targeted for the SC/STs, and yet, these communities are experiencing a positive upward movement in terms relative representation exactly at this decade. While the causality of this cannot be determined, the correlation itself is significant.

Graph 1 was plotted after decomposing the 'NBU/SC' category based on the method discussed in section 4.1. Therefore, members classified into this group were included in either NBU or SC/ST groups. As opposed to this, Graph 1' is drawn including 'NBU/SC' as a fifth category. A comparison of these graphs reveal that once the 'NBU/SC' group is accounted separately, the change in the relative representation for SC/STs since the '90s, is not as sharp as it was in graph 1, in fact the 'pure' SC/ST groups remain severely under-represented. Therefore, graph 1' possibly

capture a clearer picture of the correlation between the implementation of Mandal Commission's report and the representation of SC/STs.

However, even in Graph 1', there is an upward trend in representation for the SC/STs since the '90s. There can exist multiple possible channels through which Mandal Commission Report could have affected the representation of SC/STs, although it is difficult to analyze these arguments through statistical methods. For example, one can argue that awareness about RP amongst the lower caste groups increased during the nationwide anti-reservation protests during 1980-90. Therefore, possibly for the first time some of the members from SC/ST communities became aware that such a policy existed and hence started enjoying the benefits of it.

Table 1 presents the intergenerational rates of persistence (vis-à-vis mobility) calculated as 'p' (expression 3) for all social groups of interest. The findings are in accordance with the expectations set by graph 1', as all groups reflect a high value of 'p', implying a rigid society. In particular, the SC/STs and the Brahmins are more mobile than the other groups as the respective values of 'p' for these communities is less than the other groups. The values are very similar in both columns 1 (undergraduate) and 2 (postgraduate), however, mobility is marginally less among the postgraduates.

Table 1:Intergenerational rates of Persistence

Social Group	Degree Objective	
	Undergraduate	Postgraduate
Brahmins	0.85	0.89
SC/ST	0.79	0.81
NBU	0.93	0.96
Muslims	0.95	0.97

This difference in mobility between undergraduates and postgraduates could be attributed to the fact that being a postgraduate itself is rarer than being an undergraduate in the general population. Thus, a postgraduate from this elite public university would be relatively higher in terms social

prestige of an undergraduate. Given the challenges and rigidity caused by caste structures, one would expect that the higher is the social status, higher would be the ‘p’, vis-à-vis lower will be the intergenerational mobility.

Result 2: *Merit vs Equity: Lower castes are more mobile in top percentiles post 1990s.*

(Note: This analysis leaves out the Muslim group since there were marginal representation of Muslims in the earlier decades, and Muslims in top 15 percentile were either rare or missing)

As Table 2 suggests, the situation is a bit different from table 1, when the same analysis is applied for only the top 15 percentile of the students. One can observe that the intergenerational rates of persistence is relatively less, implying higher mobility of all social groups within the top 15 percentile. The same could be verified from graph 2 in terms of relative representation as well.

The results of the merit-based analysis of social mobility have some non-trivial implications. First, conventional wisdom would suggest that as an effect of RP, the upper caste groups would experience better outcomes in percentile rank whereas the lower caste groups would experience the opposite. This hypothesis holds true for this data on an average. Table A.1 reflects that post ‘90s the Brahmins are experiencing higher percentile rank on an average than the SC/STs. However, if one splits the data and investigates only the higher percentiles of rank, the representation of SC/STs increase sharply since the ’90s, displacing mostly Brahmins and some Non-Brahmin upper castes.

Table 2: Intergenerational rates of Persistence among the top 15 percentile

Social Group	Degree Objective	
	Undergraduate	Postgraduate
Brahmins	0.78	0.79
SC/ST	0.69	0.75
NBU	0.85	0.82

Therefore, while the conventional wisdom remains true for average percentile ranks, the case is different for the upper percentile of students. This finding can possibly add a dimension to the

debate of ‘merit vs equity’ between the anti and pro-reservation camps (respectively). From the sharp breaks observed in the graphs, it becomes evident that there is an influx of meritorious lower caste students since the ‘90s. Such implications possibly suggest that affirmative actions aimed at social inclusion does not necessarily lead to an exclusion in terms of merit.

Result 3: *Sub-caste matters: But is endogamy the sole channel of social rigidity?*

As discussed already, one motivation to analyze the case of sub-castes is to check whether endogamy between castes is the sole factor behind social rigidity of India. It is known for a fact that for a long span of time, inter-caste marriage was socially prohibited. Even now the practice continues, although instances of inter-caste marriage are growing in numbers. However, intra-caste marriage (between two individuals with distinct surnames of the same caste group) have been practiced for a long time. Thus, one could rationally expect that social mobility of distinct surnames within the same caste group would be relatively higher than inter-caste social mobility.

As discussed in section 4.1, three caste-based groups, namely the Brahmins, the Non-Brahmin Upper castes and the SC/STs could be classified into groups of surnames in orders of sub-caste hierarchy.

The Brahmins are classified into three groups. The highest group consists of two surnames - Bhattacharya and Gangopadhyay. The second group includes three surnames - Bandyopadhyay, Mukhopadhyay, Chattopadhyay and Chakravarty. The third group consists of all other Brahmin surnames that appear in the data. This group includes about 100+ unique Brahmin surnames.

In terms of relative representation, the highest sub-caste within the Brahmins dominate the others as they are over-represented within the elite population (Graph 3). In terms of intergenerational mobility, all the sub-caste groups remain socially rigid, as reflected by high values of ‘p’ in table 3.

Table 3: Intergenerational rates of Persistence among Sub-castes		
Social Group	Degree Objective	
	Undergraduate	Postgraduate
Highest Brahmins	0.91	0.97
Average Brahmins	0.93	0.95
Other Brahmins	0.87	0.83

Despite intra-caste marriage being allowed within Brahmins, the rigidity exists, and one can assign various probable causes to it. First of course, is the high social prestige of the highest sub caste of Brahmins which bestowed them with enough social capital, which in turn leads to their dominance in educational status. Second, these highest Brahmins were the most elite priests, who not only had supreme authority over Hindu religious texts but were also in charge of educating others in the respective kingdom/neighborhood. Thus, their role as educators could have given them a head-start for dominating in any fields of elite occupation and education.

Even within the NBUs (table A.2) and SCs (table A.3), similar trends are observed, where a relatively prestigious sub-caste dominates the lower sub-castes. Quite interestingly, as reflected in graph 5, the STs are catching up much later (hence most mobile), while those SC surnames which were classified from the mixed group, continue to be over-represented in the elite population. All SC/ST surnames, however, gain traction during 1980-90.

The results and arguments presented in this section is checked for robustness in the next section of the paper. A replication of all the steps adjusting for gender, faculty and subgroup (sub caste) implies some more interesting patterns in addition to the existing ones.

6 Robustness/Consistency of the Main Results

6.1 Gender

All the results related to relative representation and social mobility holds true when the students are split in further groups according to gender. The classification of gender is achieved through the technique outlined in section 4.1.

There are two folds of the comparative analysis with respect to gender. First, graph 6 compares the trends of relative representation *within* 'all' students versus the 'male' and the 'female'. The respective rates of rigidity are compared similarly in table 4 (undergraduates only, since postgraduates don't reflect any significant changes).

Table 4: Gender based decomposition of Inter-generational rates of Persistence

caste groups	Population Characteristics		
	All	Male	Female
Brahmins	0.85	0.81	0.86
SC/ST	0.79	0.75	0.85
NBU	0.93	0.85	0.97
Muslims	0.95	0.91	0.98

Once again, in each case, the Brahmins are over-represented while the Muslims and SC/STs experience severe under-representation. The patterns reveal the same phenomena – post 1990s, the lower castes and Muslims experience better outcomes in terms of relative representation. However, within the female undergrads (and postgrads), the rigidity of social groups is higher than that within the male population, since the estimated intergenerational rate of persistence within the female groups are higher, in comparison to that of the male students.

The second approach, however, splits the entire student population into 8 groups[12] and calculates intergenerational rigidity rates for each of them (Table A.4). This is more useful in comparing the rigidity rates 'between' groups. The standard observations remain true since the mobility rates remain low for all groups, with SC/STs experiencing relatively higher rates of mobility. Graph 7 shows that all upper caste groups are over-represented and SC/STs are under-represented as usual. Further, almost all caste groups move similarly across gender, except for the curious case of

[12] Derived from the combinations of {Male, Female} x {Brahmin, NBU, SC/ST, Muslims}

Brahmins. In fact, the most striking feature of graph 7 is that female Brahmins experience a higher rate of relative representation since the year 2000 – which is against the usual trend. Since there is no provision of RP for women, the possible reasons of this change could be attributed to the relaxing of patriarchal norms and stereotypes - an explanation follows.

Within a patriarchal society like India, female individuals often had to choose their career according to compulsions imposed by pre-conceived notions of assigned gender roles. Thus, for a long time, the idea was that women cannot fare equal to men if they pursue a career in STEM, and that literature or philosophy (or Humanities, in general) is the sole career path of an 'educated' woman. In fact, patriarchal norms dictated a fundamental difference in the very purpose of higher education for men and women. The Men were supposed to become the earning members of a family, while for most of the women, being a graduate served the purpose of being a 'qualified bride' in the marriage market. Thus, disciplines with relatively more options in the labor market, experienced a higher concentration of men, as opposed to fields within the Arts which had limited labor market opportunities (and higher participation of women). As the Indian economy went through liberalization in 1991, the markets opened up and created more jobs, which in turn increased the demand for skilled labor in all possible fields including the Arts. Further, sociologists argue that liberalization also coincided with changing family structures - the so called 'Joint' families[13] got split into several 'Nuclear' families[14], which meant increased economic pressure on the child to support their parents. Therefore, now women from an average or lower income groups were expected to support her family as well, which could only be done by joining the labor market. This meant they had to break away from assigned gender roles and study in disciplines with better job market prospects. The increased demand of skilled labor due to the liberalization, could therefore perfectly accommodate the increased supply of women in the labor market. On the other hand, observing the increased demands of Arts graduates in newly opened up markets, men now pursued higher education in various disciplines of Arts as well.

While it is impossible to assert the causality of this argument, I attempt an alternative way of explaining the possible correlation. I first split the data of all undergrads (and postgrads) into three separate faculties – Science, Arts and Engineering. Within each faculty, I examine the relative

[13] large number of family members, including the extended family, living together.
[14] Only individuals directly related as Parents and children living together.

representation and calculate ‘p’s for all 8 social groups. Indeed, the results fit to the expectations based on the above arguments. The female Brahmins are less rigid in STEM ($p = 0.75$) as opposed to Arts ($p = 0.86$), while the male Brahmins are less rigid in Arts ($p = 0.9$) as compared to STEM ($p = 0.83$). In terms of relative representation as well, female students dominate their male counterparts in the disciplines within the Arts, while the reverse is observed in the faculties of Science and Engineering until the 1990s. Graph 8 further reveals that the rates of representation are changing in all the three faculties during the last 20 years (appx). Thus, in accordance with our expectation, in Arts, the male students are observed to be catching up with females, while the female students seem to be catching up with males in disciplines within Science and Engineering, since 2000.

Therefore, these findings seem to support the hypothesis that the overall changes in relative rates of representation is correlated with the dynamics of changing social norms.

These findings, therefore, provides further motivation for decomposing mobility rates by faculties, which is discussed in the next sub section.

Much to the author’s surprise, the other two main results related to the top 15 percentiles and sub-castes are almost unaltered when carried out for the female population, and therefore, to avoid repetition, these results for females are not discussed in sub-section.

6.2 Faculty

There exist multiple motivations to split the data by faculties - Science, Engineering and the Arts. In addition to the aforementioned interaction between gender, caste and faculties, one could argue that the patterns of mobility and representation would hold (or fail to hold) across different faculties. This could be argued from the perspectives of social norms and economic conditions as well.

Due to perceptions formed by social norms, the degree of elitism within undergrads (or postgrads) vary across faculties. For example, the social prestige of being a graduate in Sanskrit literature could be very different from a graduate in electrical engineering. While it is difficult to ascertain relative hierarchy of prestige between faculties, one can still verify if these varying perceptions of social prestige affect the overall mobility rates. For example, the socially backward or less

privileged groups could be relatively more represented in less prestigious departments within a faculty, due to lower level of aspiration or reduced competition at the level of entry.

Again, from an economic point of view, it could be argued that faculties with higher economic prospects in the labor market will experience a higher concentration of lower caste students. This is because on an average, the lower caste households are poorer than their upper caste counterparts, and therefore they are more likely to study in disciplines with higher economic prospects.

The results, however, are consistent with prior findings. For all three faculties, the rates of relative representation of all social groups reflect similar patterns as before, with increased rates of participation for lower castes and Muslims since the '90s. This implies that at least between the faculties there is no exception in terms of relative representation.

The estimated rates of intergenerational mobility show similar trends as well, as the results are consistent with prior findings. As reflected in Table 5, across all three faculties, the most mobile group continue to be that of the SC/STs. Splitting the faculties further into departments does not change the patterns of mobility. Therefore, the first main result of this paper (that the social groups are generally rigid with the relative exception of groups under RP) holds true across faculties (or even departments).

Table 5: Inter-generational rates of persistence between social groups

caste groups	Faculty		
	Arts	Science	Engineering
Brahmins	0.82	0.86	0.79
SC/STs	0.88	0.79	0.75
NBU	0.89	0.85	0.86
Muslims	0.95	0.97	0.92

Some differences, however, are observed in terms of the relationship between merit and mobility. Among the top 15 percent of the Arts faculty, the Brahmins tend to dominate more in the years since 1990s, as compared to the lower caste groups (graph 9). This contrasts with the second main

result of the paper which states that even within the top 15 percentile of ranks, SC/STs experienced higher relative representation while the Brahmins fared worse in the later decades.

There could be multiple arguments why this result is reversed for Arts, despite holding true for the Engineering or Science faculties. In fact, the same arguments discussed earlier (such as aspiration or economic need) could explain the phenomena, albeit the causality cannot be determined statistically.

Economically, the lack of lower caste representation among the top 15 percent in Arts faculty could be attributed to the fact that more qualified and meritorious students from the lower caste communities deem it more rational to choose a career in disciplines of Engineering with higher job market returns. The post ‘90s decade thus see an influx of meritorious students in the top 15 percentile of ranks in Engineering or Science, but not in Arts. The continuation of this trend even after 2000, could again be attributed to a mix of socio-economic reasons. With the liberalization of Indian economy, the meritorious sect within the Brahmins could now pursue disciplines that requires a specific passion (such as for Bengali, English or Comparative Literature), thanks to the increased possibilities in labor market as an Arts graduate. Therefore, the top 15 percentiles of a cohort were dominated by the Brahmins in the field of arts.

Like in the case of gender, variations in faculty do not alter the third main result (related to sub-caste and endogamy) of this paper.

7 Conclusion

To summarize the discussion so far, first, this paper finds that Indian society is generally rigid, as reflected by the high values of intergenerational persistence. However, whatever little mobility is experienced by the social groups, that could be attributed to modifications in RP during the 1980s. This is when the groups under RP experience a little upward movement in terms of relative representation. This finding holds true irrespective of different degrees of perceived social elitism between faculties vis-a-vis departments, and even remarkably consistent across gender.

Second, to shed some light on possible relationship between endogamy and social rigidity, sub-caste-based mobility rates were analyzed. The results show that even without endogamy, the sub-castes are internally rigid, and represented relatively in orders of their respective hierarchy. Thus,

the paper argues that endogamy is not the sole channel of rigidity but historical privileges are possibly more dominant in determining social mobility. This result too, holds consistently across variations in gender and faculty.

Finally, to analyze the effects of RP on academic performance of various groups, this paper analyzed social mobility of all groups (except Muslims) within the top 15 percentiles of students in each decade. The paper finds that within these elite of the elites, the mobility rates are relatively high, and argues further that RP has not displaced meritorious upper caste students with relatively less meritorious lower caste students. Rather, the trends suggest that the influx of meritorious lower caste students are possibly correlated with modified version of RP implemented during the 1980s.

Thus, in conclusion, this paper suggests that RP is indeed affecting its target group by improving relative rates of representation, yet, historical backdrop of the 3000 year-old caste system, makes the social mobility rates too low for a modern country.

References

1. Gregory Clark, Zach Landes (2012); "Caste Versus Class: Social Mobility in India, 1860-2012";

2. Thomas E. Weisskopf (2004); "Affirmative Action in The United States And India: A Comparative Perspective"; Volume 56, Routledge Frontiers of Political Economy; Routledge, 2004

3. Bowen, W.G. And D. Bok (2000), The Shape of The River. New Jersey: Princeton University Press.

4. Long, M. (2004), "Race and College Admissions: An Alternative to Affirmative Action," The Review of Economics and Statistics, 86(4), 1020-1033.

5. Epple, D., Romano, R., And Sieg, H (2008), "Diversity and Affirmative Action in Higher Education," Journal of Public Economic Theory, 10(4), 475-501.

6. Howell, J. (2010), "Assessing the Impact of Eliminating Affirmative Action in Higher Education," Journal of Labor Economics, 28(1), 113-166.

7. Velaskar, P R (1986), "Inequality in Higher Education: A Study of Scheduled Castes Students in Medical Colleges of Bombay", Unpublished Ph. D Dissertation, Tata Institute of Social Sciences, Mumbai

8. Patwardhan, V. And Palshikar, V. (1992). Reserved Seats in Medical Education: A Study. Journal of Education and Social Change, 5, Pp.1-117.

9. Virginius Xaxa (2002); Ethnography of Reservation in Delhi University, Vol. 37, Issue No. 28, 13 Jul 2002.

10. "The Harijan Elite: A Study of Their Status, Networks, Mobility and Role in Social Transformation"; Sachchidananda., Lal, A. K., Tiwary, S. N; Published by Thomson Press (India) Limited (1977)

11. Verónica C. Frisancho Robles, Kala Krishna (2012); Affirmative Action in Higher Education in India: Targeting, Catch Up, And Mismatch (NBER Working Paper No. 17727)

12. Bertrand, Marianne & Hanna, Rema & Mullainathan, Sendhil (2010), "Affirmative Action In Education: Evidence From Engineering College Admissions In India," Journal Of Public Economics, Vol. 94(1-2), 16- 29.

13. A K. Vakil (1985) Reservation Policy and Scheduled Castes in India; APH Publishing.

14. Aikara, J. (1980). Scheduled Castes & Higher Education: A Study of College Students In Bombay. Poona: Dastane.

15. Chitnis, S. (1981). A Long Way to Go--: Report on A Survey of Scheduled Caste High School and College Students in Fifteen States of India. New Delhi: Allied.

16. Bagde, Surendrakumar, Dennis Epple, And Lowell Taylor. 2016. "Does Affirmative Action Work? Caste, Gender, College Quality, And Academic Success in India." American Economic Review, 106(6): 1495-1521.

17. Kumar, K. (1997); “Educational Inequality and Language”; In R.P. Sinha (Ed.) Inequality in Indian Education, New Delhi: Vikas Publishing House.

18. Sujoy Chakravarty & E. Somanathan, 2008. "Discrimination in an elite labour market? Job placements at the Indian Institute of Management, Ahmedabad," Indian Statistical Institute, Planning Unit, New Delhi Discussion Papers 08-01, Indian Statistical Institute, New Delhi, India.

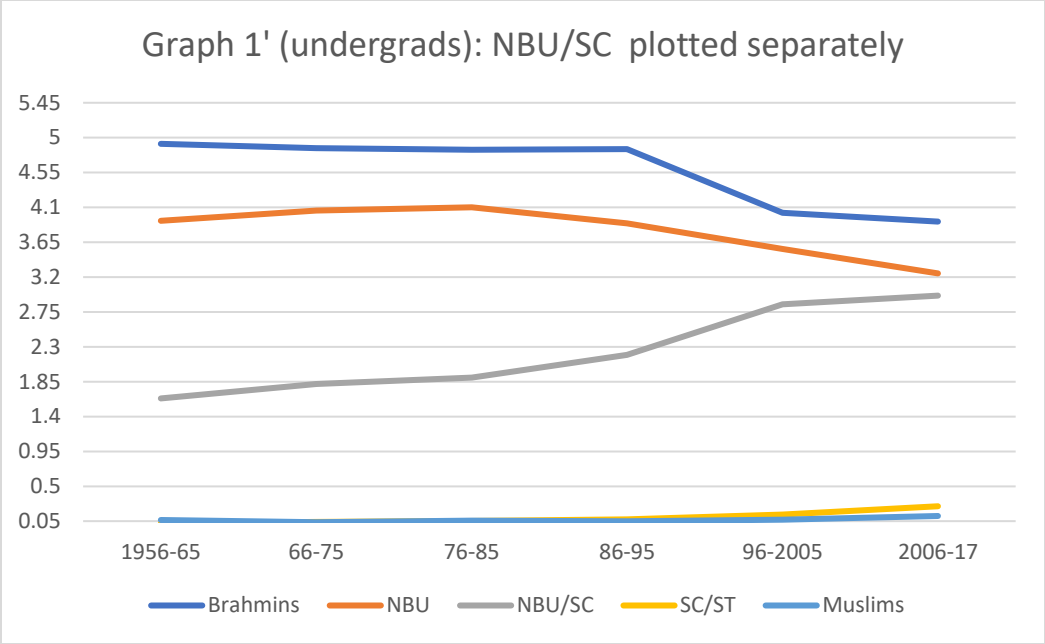
Appendix A: Graphs and Tables

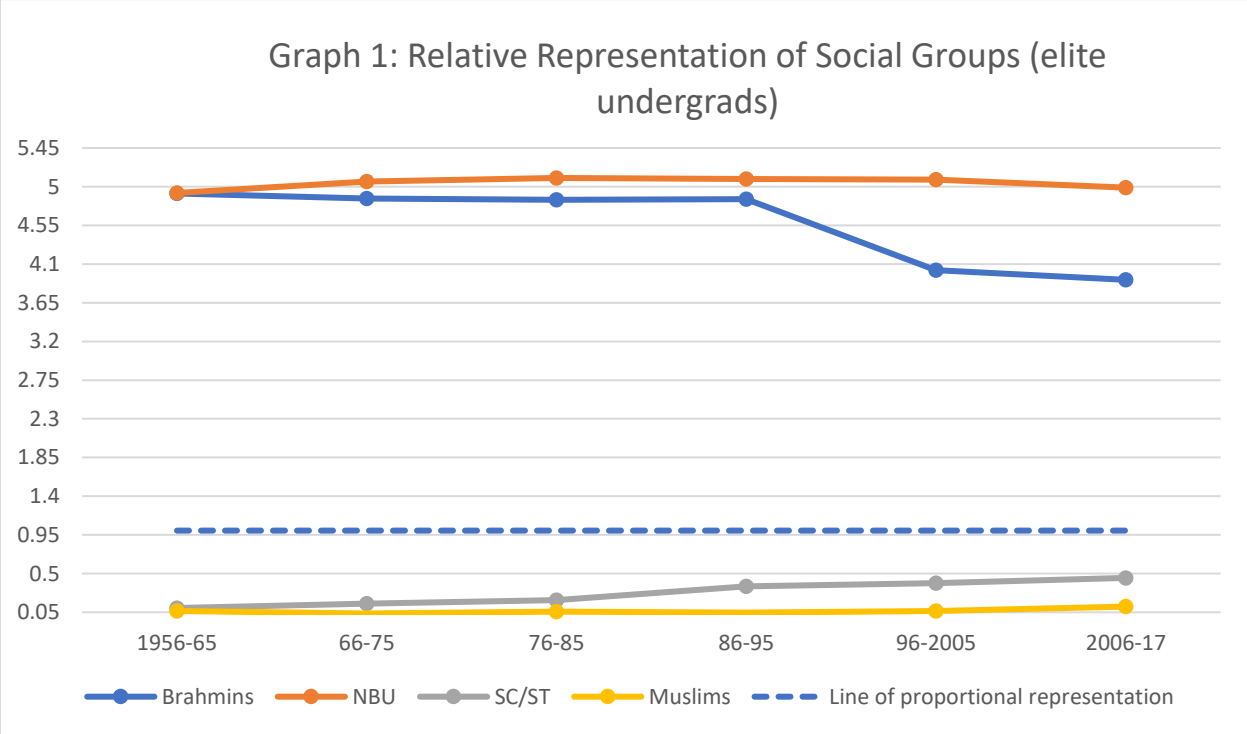
Table A.1: Average Rank of all Social Groups								
	Undergraduates				Postgraduates			
	Brahmin	SC/STs	Muslim	NBU+	Brahmin	SC/STs	Muslim	NBU+
1956-65	48.463	45.713	64.940	48.818	50.356	48.818	50.789	50.033
1966-75	50.149	44.454	31.460	51.014	52.756	58.643	67.367	49.192
1976-85	49.042	50.333	47.738	51.032	49.802	52.291	44.927	50.658
1986-95	44.193	65.985	54.710	51.529	47.311	59.031	47.758	50.856
1996-2005	44.363	64.036	47.695	50.716	45.373	59.193	57.341	49.952
2006-17	44.777	64.297	59.193	52.146	46.565	56.518	56.013	50.002

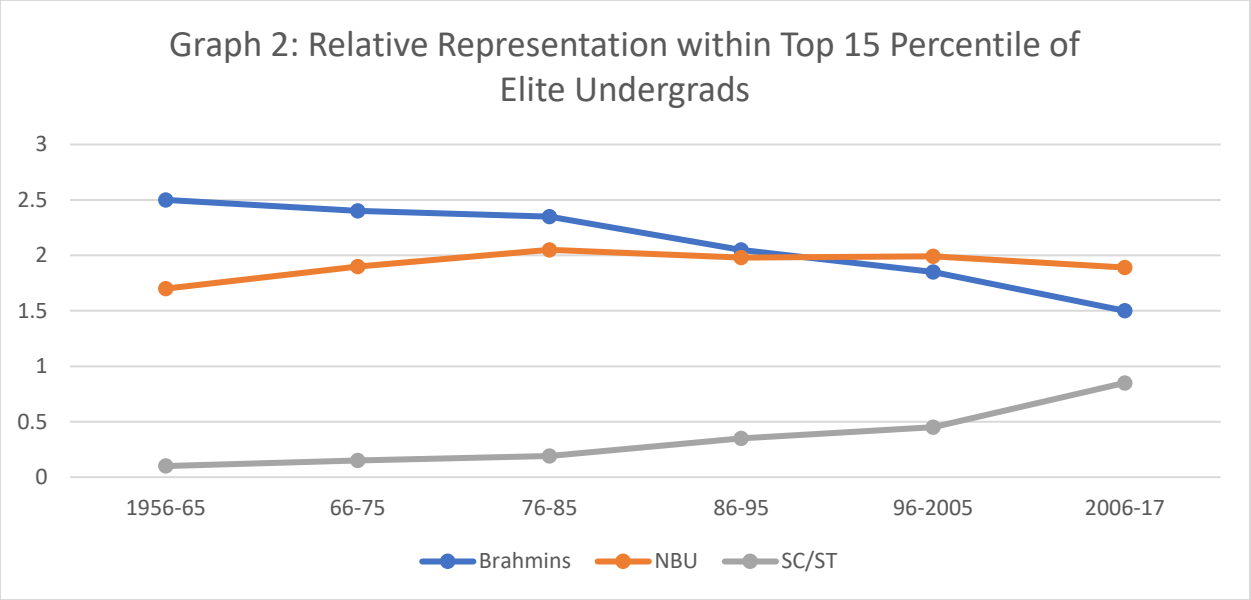
Table A.2: Sub-caste based Inter-generational rates of persistence (NBUs)		
Sub-caste groups	Degree Objective	
	Undergraduates	Postgraduates
Vaidya Surnames	0.95	0.93
Kulin Kayastha Surnames	0.91	0.93
Other Surnames	0.88	0.85

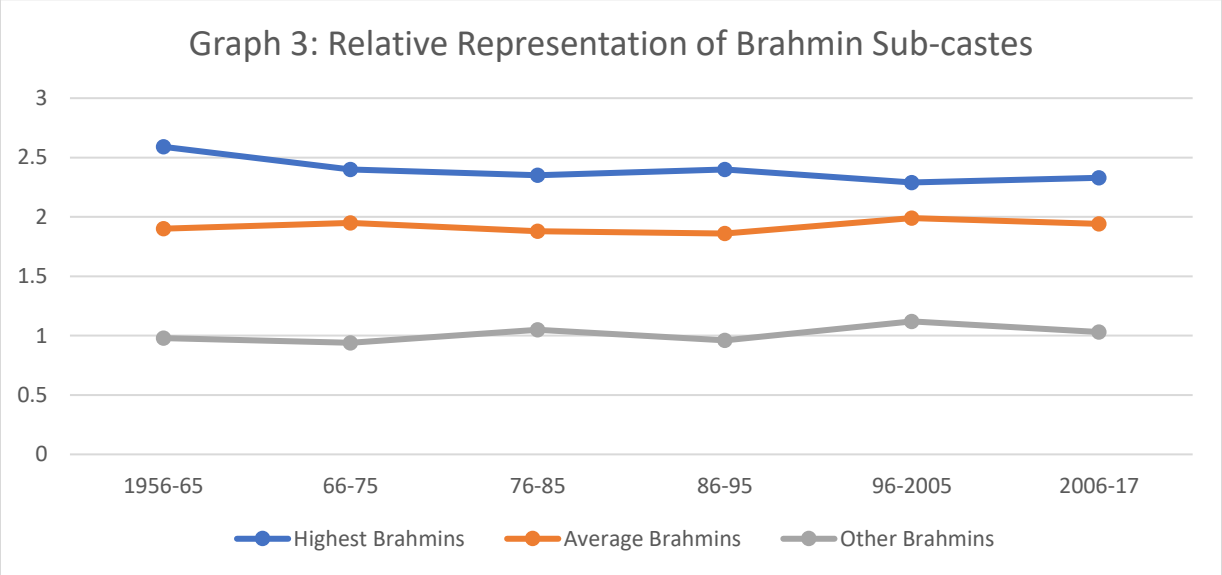
Table A.3: Sub-caste based Inter-generational rates of persistence (SC/STs)		
Sub-caste groups	Degree Objective	
	Undergraduates	Postgraduates
Mixed SC Surnames	0.83	0.86
Unambiguous SC Surnames	0.81	0.90
ST surnames	0.79	0.85

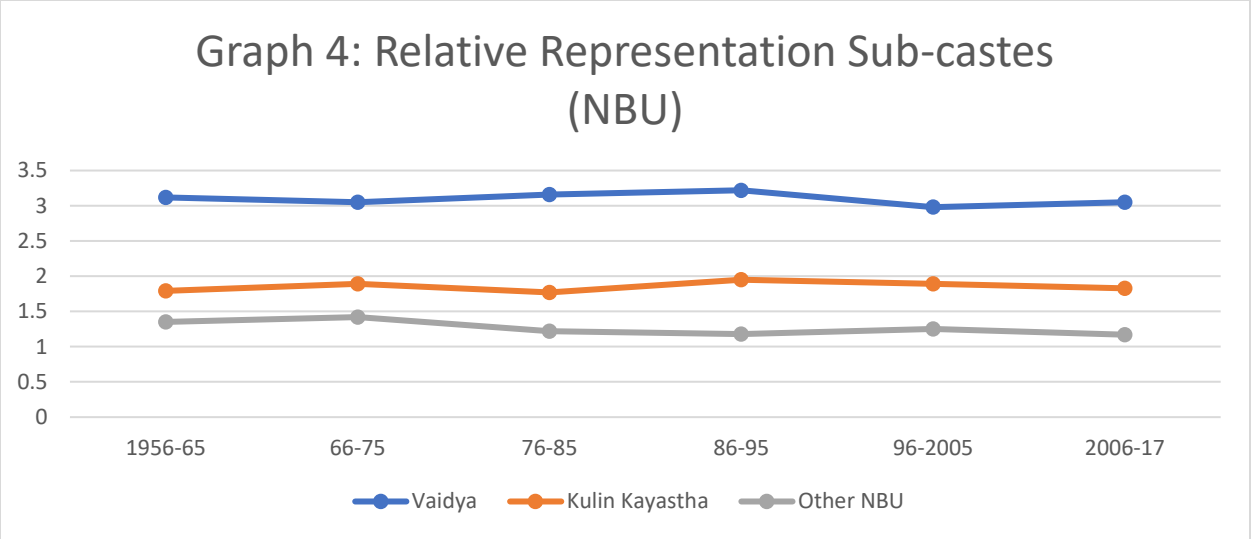
Table A.4: Inter-generational rates of persistence between social groups		
caste groups	Degree Objective	
	Undergrads	Postgrads
Female Brahmins	0.82	0.86
Male Brahmins	0.85	0.85
Female SC/ST	0.73	0.80
Male SC/ST	0.69	0.77
Female NBU	0.89	0.91
Male NBU	0.82	0.86
Female Muslims	0.97	0.95
Male Muslims	0.93	0.92

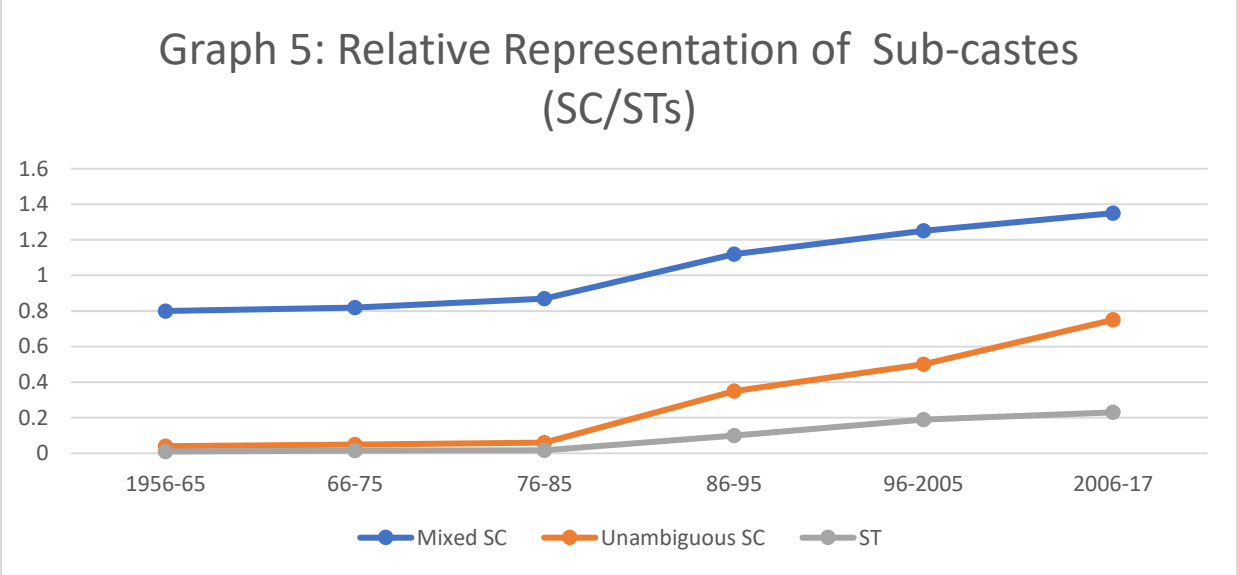

Graph 1' (undergrads): NBU/SC plotted separately
5.45
5
4.55
4.1
3.65
3.2
2.75
2.3
1.85
1.4
0.95
0.5
0.05
1956-65
66-75
76-85
86-95
96-2005
2006-17
Brahmins
NBU
NBU/SC
SC/ST
Muslims

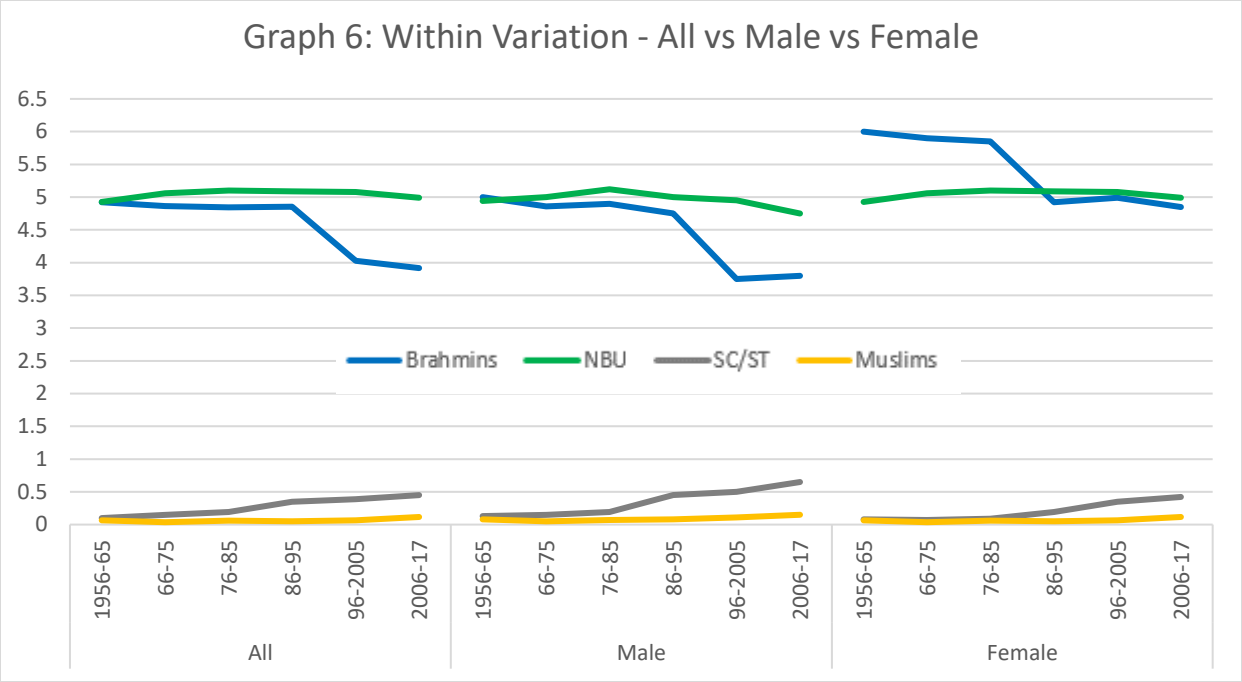

Graph 1: Relative Representation of Social Groups (elite undergrads)
5.45
5
4.55
4.1
3.65
3.2
2.75
2.3
1.85
1.4
0.95
0.5
0.05
1956-65
66-75
76-85
86-95
96-2005
2006-17
Brahmins
NBU
SC/ST
Muslims
Line of proportional representation

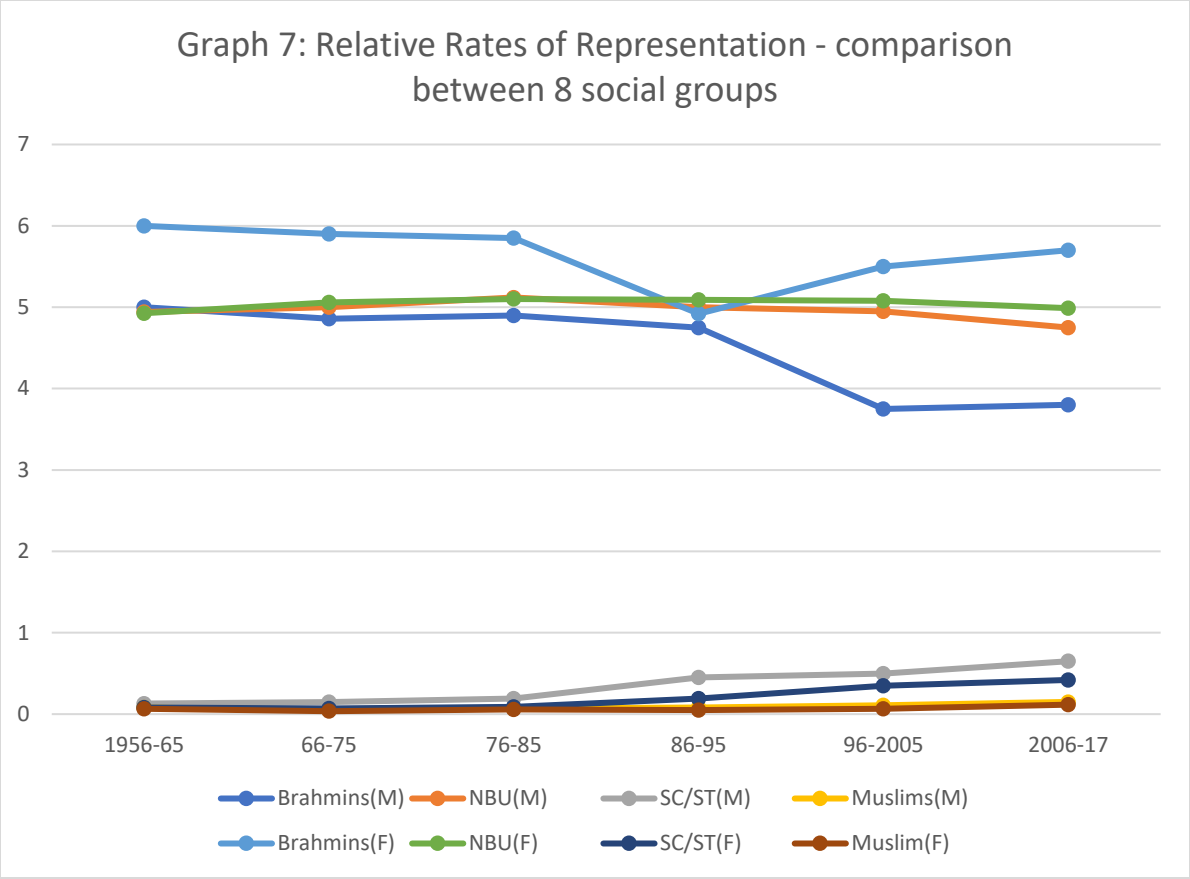

Graph 2: Relative Representation within Top 15 Percentile of Elite Undergrads
3
2.5
2
1.5
1
0.5
0
1956-65
66-75
76-85
86-95
96-2005
2006-17
Brahmins
NBU
SC/ST

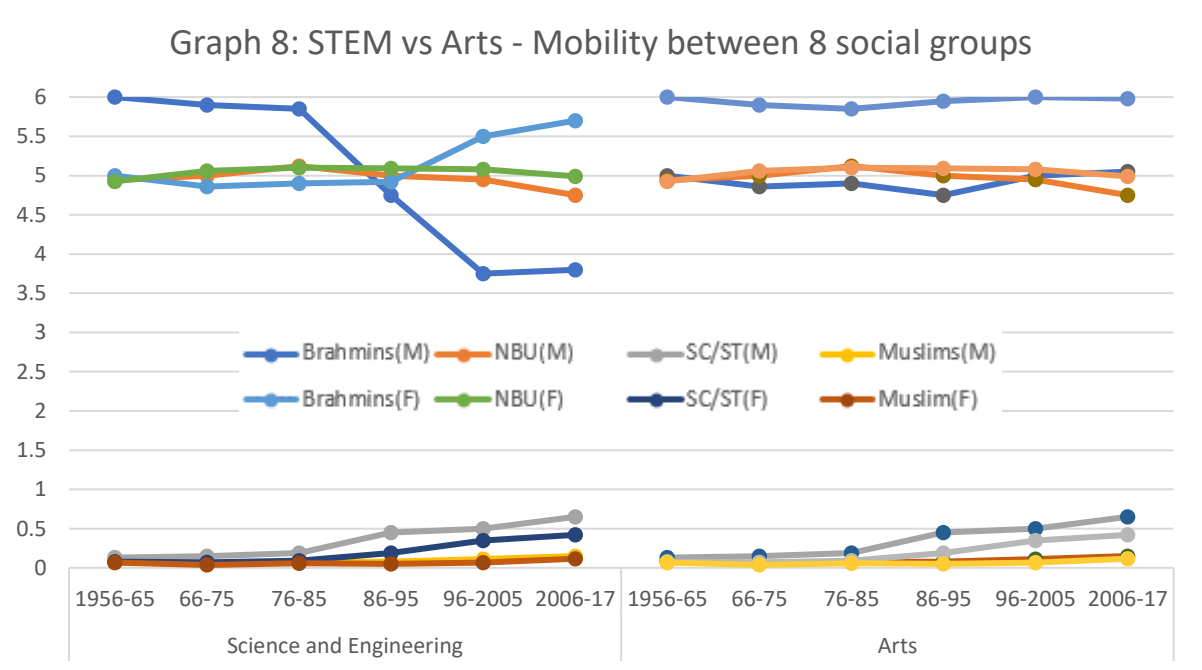

Graph 3: Relative Representation of Brahmin Sub-castes
3
2.5
2
1.5
1
0.5
0
1956-65
66-75
76-85
86-95
96-2005
2006-17
Highest Brahmins
Average Brahmins
Other Brahmins

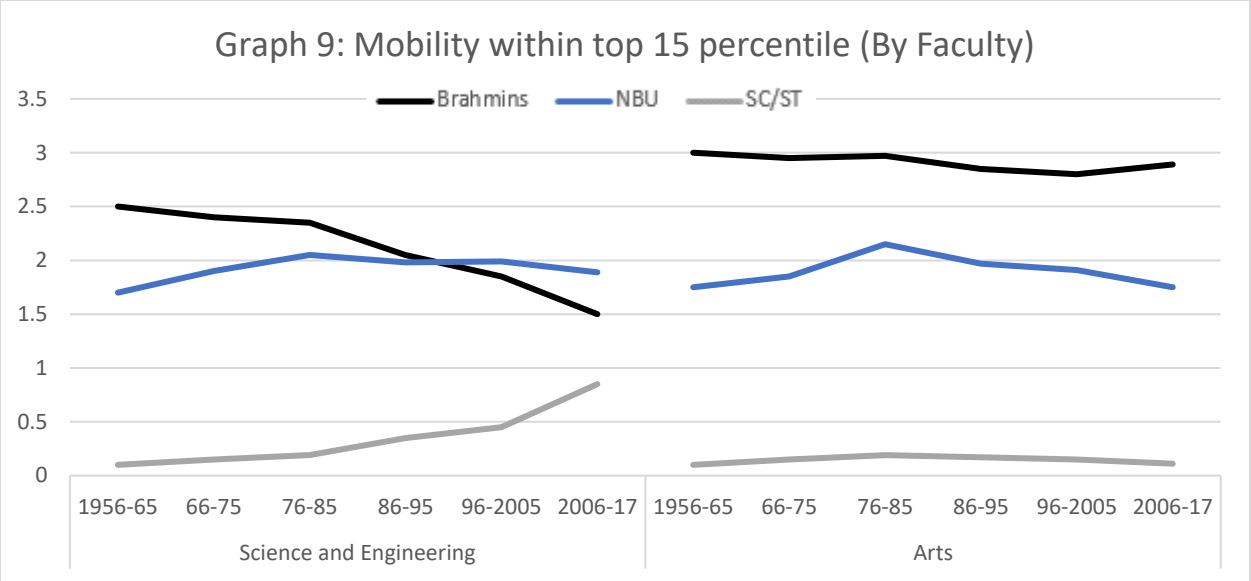

Graph 4: Relative Representation Sub-castes (NBU)
3.5
3
2.5
2
1.5
1
0.5
0
1956-65
66-75
76-85
86-95
96-2005
2006-17
Vaidya
Kulin Kayastha
Other NBU


Graph 5: Relative Representation of Sub-castes (SC/STs)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1956-65
66-75
76-85
86-95
96-2005
2006-17
Mixed SC
Unambiguous SC
ST


Graph 6: Within Variation - All vs Male vs Female
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Brahmins
NBU
SC/ST
Muslims
1956-65
66-75
76-85
86-95
96-2005
2006-17
All
Male
Female


Graph 7: Relative Rates of Representation - comparison between 8 social groups
7
6
5
4
3
2
1
0
1956-65
66-75
76-85
86-95
96-2005
2006-17
Brahmins(M)
NBU(M)
SC/ST(M)
Muslims(M)
Brahmins(F)
NBU(F)
SC/ST(F)
Muslim(F)


Graph 8: STEM vs Arts - Mobility between 8 social groups
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Brahmins(M)
NBU(M)
SC/ST(M)
Muslims(M)
Brahmins(F)
NBU(F)
SC/ST(F)
Muslim(F)
1956-65
66-75
76-85
86-95
96-2005
2006-17
Science and Engineering
Arts


Graph 9: Mobility within top 15 percentile (By Faculty)
Brahmins
NBU
SC/ST
3.5
3
2.5
2
1.5
1
0.5
0
1956-65
66-75
76-85
86-95
96-2005
2006-17
1956-65
66-75
76-85
86-95
96-2005
2006-17
Science and Engineering
Arts

Appendix B: List of SC Communities in West Bengal

West Bengal

1. Bagdi, Duley
2. Bahelia
3. Baiti
4. Bantar
5. Bauri
6. Beldar
7. Bhogta
8. Bhuimali
9. Bhuiya
10. Bind
11. Chamar, Charmakar, Mochi, Muchi, Rabidas, Ruidas, Rishi
12. Chaupal
13. Dabgar
14. Damai (Nepali)
15. Dhoba, Dhobi
16. Doai
17. Dom, Dhangad
18. Dosadh, Dusadh, Dhari, Dharhi
19. Ghasi
20. Gonrhi
21. Halalkhor
1 [22. Hari, Mehtar, Mehtor, Bhangi, Balmiki]
23. Jalia Kaibartta
24. Jhalo Malo, Malo
25. Kadar
26. Kami (Nepali)
27. Kandra
28. Kanjar
29. Kaora
30. Karenga, Koranga
31. Kaur
32. Keot, Keyot
33. Khaira
34. Khatik
35. Koch
36. Konai
37. Konwar
38. Kotal
39. Kurariar
40. Lalbegi
41. Lohar
42. Mahar
43. Mal
44. Mallah
45. Musahar
46. Namasudra
47. Nat
48. Nuniya
49. Paliya
50. Pan, Sawasi
51. Pasi
52. Patni
53. Pod, Poundra
54. Rajbanshi
55. Rajwar
56. Sarki (Nepali)
57. Sunri (excluding Saha)
58. Tiyar
59. Turi.
2[60. Chain].

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1. Subs. by Act, 25 of 2002, s. 2.
2. Subs. by Act, 24 of 2016, s. 2.

Appendix C: Sampling Strategy for choosing Electoral Registers